

## Mathematics, Grade 10

**A4D10**

What are the  $x$ -intercepts for the function  $f(x) = x^2 + 2x - 15$ ?

- A.  $(0, -5), (0, 3)$
- B.  $(0, 5), (0, -3)$
- C.  $(5, 0), (-3, 0)$
- D.  $(-5, 0), (3, 0)$

**A2D10**

Solve for the intersection of the lines that these equations represent.

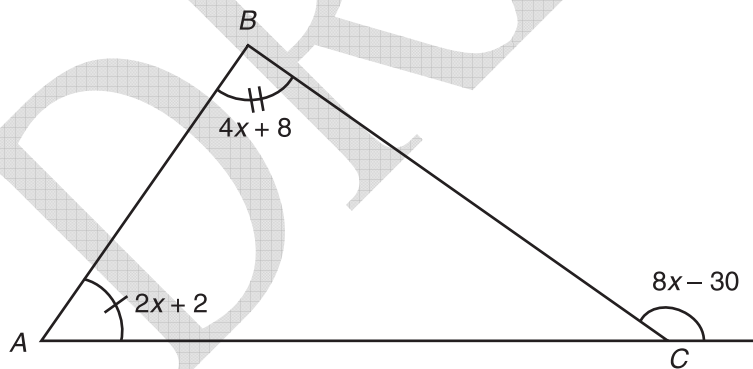
$$3x + 4y = 10$$

$$-6x - 8y = 20$$

- A.  $(2, 1)$
- B.  $(-2, -1)$
- C. infinite solution
- D. no solution

**G1A10**

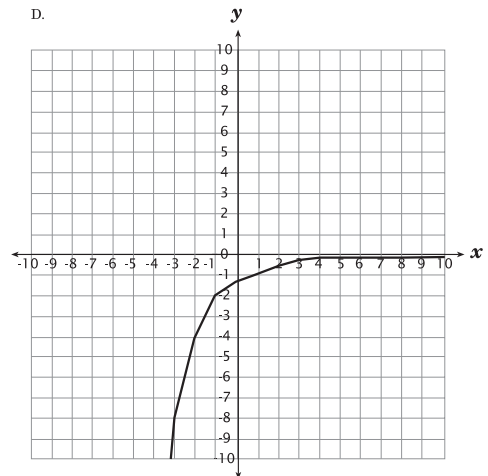
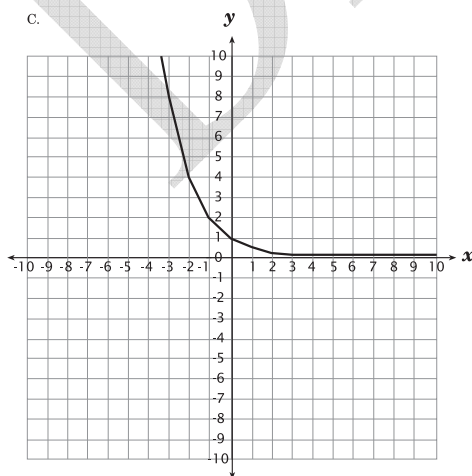
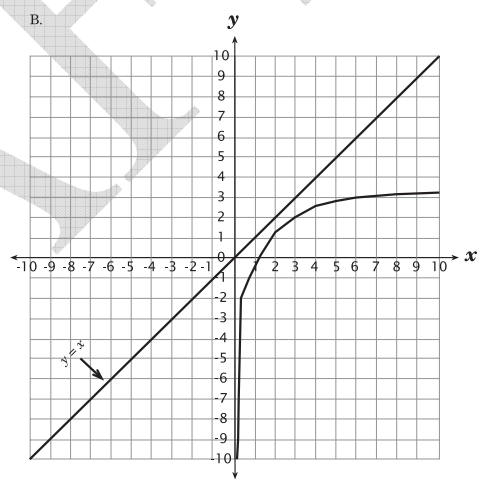
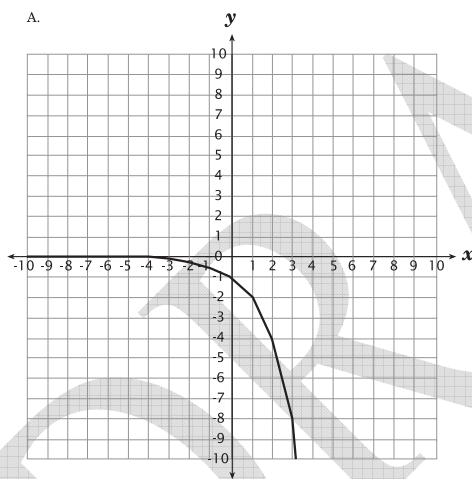
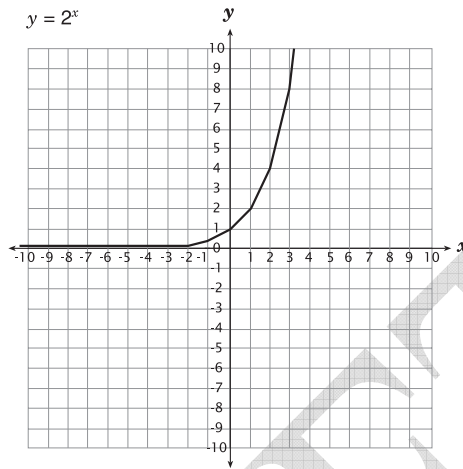
In the diagram shown, what is the measure of  $\angle BAC$ ?



- A. 30
- B. 42
- C. 50
- D. 130

**G3B10**

The sketch of  $y = 2^x$  is shown below. Which of the following sketches shows the reflection of  $y = 2^x$  across the  $y$ -axis?



**G2A10**

A circle has a center at  $(2, -3)$ . One end point of a diameter is at  $(4, -2)$ . What are the coordinates of the other endpoint of that diameter?

- A.  $(6, -1)$
- B.  $(-2, 4)$
- C.  $(1, -5)$
- D.  $(0, -4)$

**A1B10**

Which equation would produce this pattern of numbers?

8, 10, 14, 22, . . .

- A.  $y = 6 + 2^x$
- B.  $y = 6 + x^2$
- C.  $y = 6 + 2x$
- D.  $y = 8 + 2^{(x-1)}$

**A1C10**

Look at this pattern.



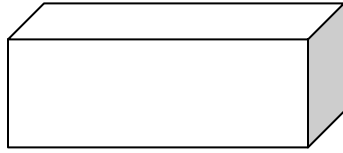
Figure:	1	2	3
Area:	6	12	24

What is the area of the 13<sup>th</sup> figure in this pattern?

- A. 6,144
- B. 12,288
- C. 24,576
- D. 49,152

**G1B10**

A rectangular prism has a volume of 324 cubic inches. If the lengths of all edges are doubled, what will be the volume in cubic inches of the new prism?



- A. 648
- B. 1296
- C. 1944
- D. 2592

**G3B10**

The graph of the quadratic equation  $y = (x + 1)^2 - 3$  is reflected across the  $y$ -axis and then translated 2 units down. Which are the coordinates of the vertex of the new graph?

- A.  $(-1, 1)$
- B.  $(1, -1)$
- C.  $(1, -5)$
- D.  $(-1, -5)$

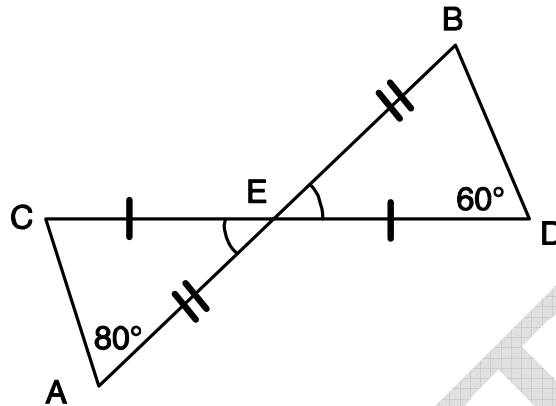
**A3A10**

Which type of function would produce the data shown in the table?

$x$	$y$
1	-2
3	6
4	7
6	3

- A. linear
- B. quadratic
- C. cubic
- D. exponential

Use the figure below to answer question \_\_ .



### G1A10

Line segments  $AB$  and  $CD$  bisect each other at  $E$ . The measure of  $\angle CAE = 80^\circ$  and  $m\angle BDE = 60^\circ$ . Amy says that  $m\angle CEA = 20^\circ$ , Brent says that it is  $30^\circ$ , Carlos says that it is  $40^\circ$ , and Debra says it that is  $50^\circ$ . Which student is correct?

- A. Amy
- B. Brent
- C. Carlos
- D. Debra

### A1E10

If the graph of the function  $f(x) = x^2 + 1$  is shifted down 5 units, what are the coordinates of the  $x$ -intercepts in the new graph? Provide work that shows how you arrived at your answer.

**A2D10**

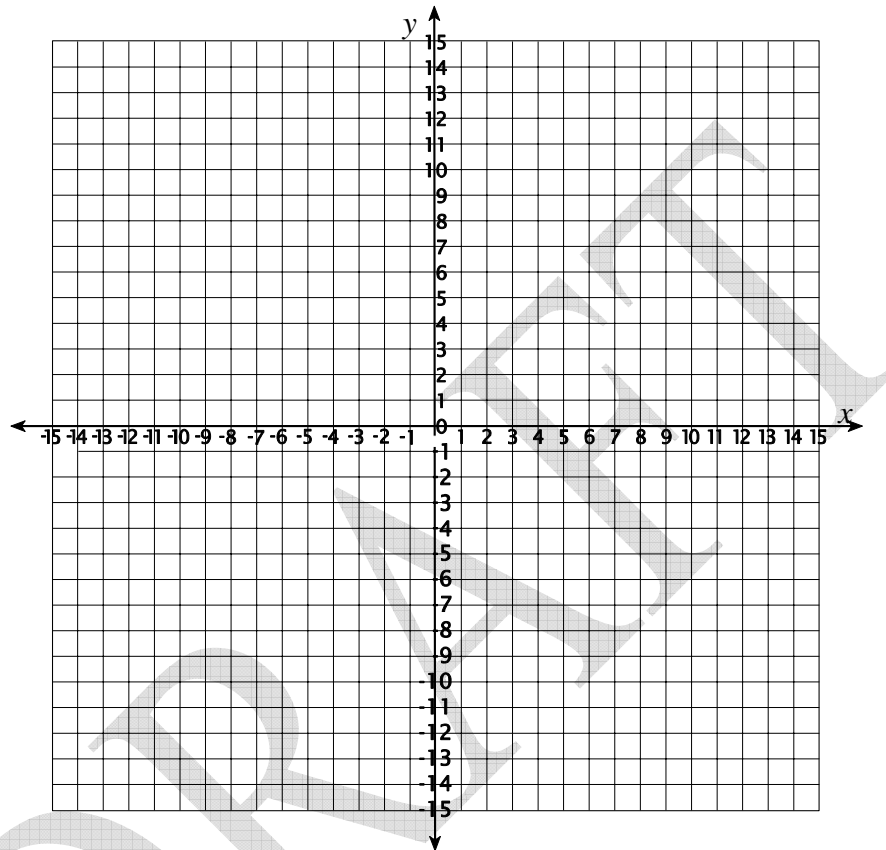
Yummy Bakery and Oh So Good Bakery had a contest with these results:  
Yummy sold 9 fewer rolls than twice what Oh So Good sold. Together they sold a total of 639 rolls. Find the number of rolls sold by each bakery.  
Provide the work that shows how you arrived at your answer.

Yummy Bakery: \_\_\_\_\_

Oh So Good Bakery: \_\_\_\_\_

**G2A10**

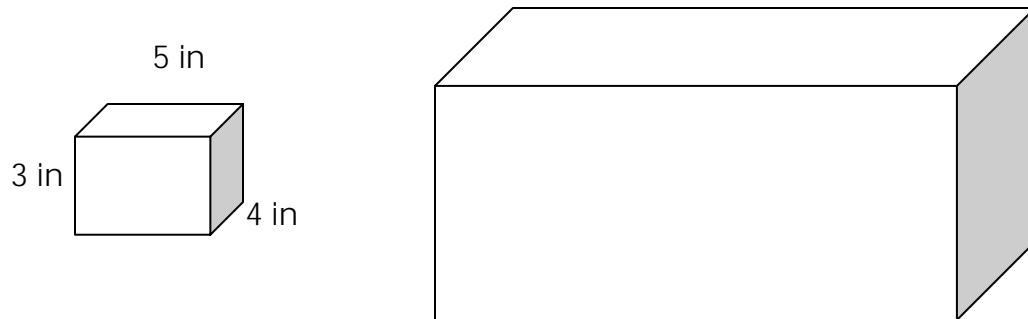
Plot these points:  $A(-3, 4)$ ;  $B(3, 6)$ ; and  $C(4, -1)$  on the coordinate graph. Then plot point  $D$  on the graph so that the quadrilateral formed is a parallelogram. Show the work necessary to verify that the figure formed is a parallelogram.



A large empty rectangular box for showing work and verification.

**G1B10**

The figures shown are two similar rectangular prisms. The smaller one has a length of 5 in, width of 4 in, and height of 3 in. Each dimension of the smaller prism has been tripled to make the larger prism.



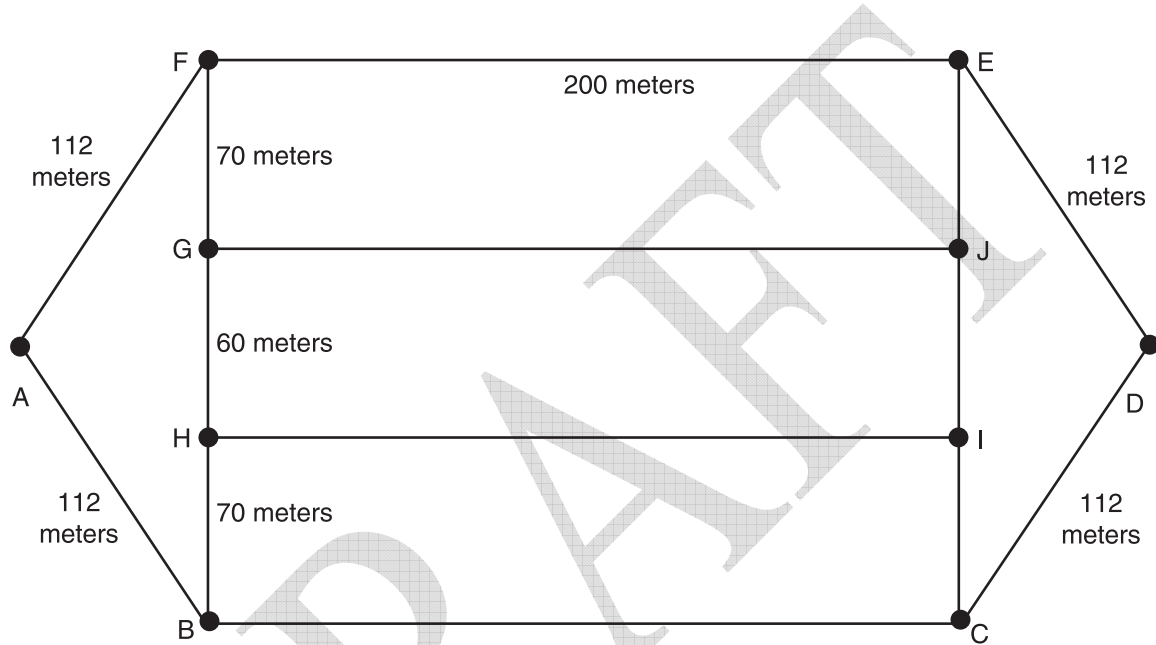
What is the ratio of the volumes of these two prisms? Provide the work that shows how you arrived at your answer and write your answer on the line.

Ratio: \_\_\_\_\_



**PE-01, G4B10**

Ryetown has decided to replace the sewer lines in its Dogwood Subdivision. Every house in the subdivision must be connected to the new sewer line. The diagram shows the houses (as capital letters) and all of the **possible** connecting paths along which the new sewer line could be dug. The new line needs **only** to connect each of the houses in a single, continuous path. The path segments shown are measured in meters (m).



As project engineer, you need to develop three possible routes for digging the new sewer line, one of which is the shortest route. The ditch digging machine can dig a sewer line at the rate of one meter every 1.5 minutes, but it cannot retrace its path. Give each of your 3 routes and their lengths, along with the amount of time the company would save if it chose the shortest route.

Route 1 Pathway: \_\_\_\_\_

Route 1 length: \_\_\_\_\_ meters

Route 2 Pathway: \_\_\_\_\_

Route 2 length: \_\_\_\_\_ meters

Route 3 Pathway: \_\_\_\_\_

Route 3 length: \_\_\_\_\_ meters

Amount of time saved by using the shortest route: \_\_\_\_\_ minutes

**PE-04, G4B10**

Afarm, Inc. has set aside a rectangular field measuring 2,275 feet by 1,500 feet for production of grain. The average yield from this field is 2,250 pounds of grain per acre (1 acre = 43,560 square feet).

You must present a plan to the CEO of Afarm, Inc. for purchasing storage units for this grain. The storage units come in two sizes, each of which is cylindrical in shape. Your plan must stay under a budget of \$200,000.

Storage Unit A: 45 feet tall, diameter = 18 feet; cost = \$31,000

Storage Unit B: 70 feet tall, diameter = 20 feet; cost = \$60,000

Each storage unit can store 7.9 pounds of grain per cubic foot.

Write a memo to Afarm's CEO that presents your plan for storing the grain. Provide the work that shows how you arrived at your plan, including the expected amount of grain, calculations of volume for each storage unit, the number of each type of unit that should be bought and the total cost of your plan.

Qty. of Unit A to purchase: \_\_\_\_\_ Qty. of Unit B to purchase \_\_\_\_\_

Total cost of purchase: \$ \_\_\_\_\_